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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/795,917

03/08/2004

Gregory D. VanWiggeren

10031440-1

1826

7590

06/15/2005

AGILENT TECHNOLOGIES, INC.

Legal Department, DL429

Intellectual Property Administration

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EXAMINER

PENG, CHARLIE YU

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

JK

Office Action Summary	Application No. 10/795,917	Applicant(s) VANWIGGEREN ET AL.	
	Examiner Charlie Peng	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 12-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 6, 10, 11 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/08/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-9, 12-15, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,466,322 Paldus et al. in view of U.S. Patent 6,512,588 to Hill. Paldus teaches a single frequency light source (CWLS) **110** that produces a light signal having a first component (lightwave as a component of an optical signal) having a first polarization and a second component having a second polarization. (See at least **Fig. 2** and its descriptions and **column 4, paragraph 2**) A frequency shifter that shifts a mean frequency of the first component with respect to a mean frequency of the second component by a frequency shift $\Delta\nu$. The light signal is then coupled into a ring-down cavity (defined as target here) **120**, where it decays and becomes an optical signal of a third and a fourth component. A photodetector (detector) **150** detects the

light signal exiting the cavity **120** and provides an output signal, which is eventually passed a processor unit **180**. Paldus further teaches that the CWLS may be tunable light source, e.g., a single frequency tunable laser with tuning range of 765-790nm.

(See **column 5, last paragraph**) Paldus does not teach the process extracting a phase difference between the third and fourth lightwave, but phase difference is a well known parameter in optical phase detecting and measurement. For example, Hill teaches an interferometer system **110** having a measurement object mirror that introduces frequency phase shifts between the measurement beam and reference beam components, and a detector and a signal processor system **180** that measures the intensity of mixed beams and extracts and determines the phase difference. It would have been obvious to one having ordinary skill in the art at the time the invention was made make the phase difference measurement using Paldus' invention. The motivation would be to determine additional parameters such as angle and distance between mirrors of the ring-down cavity.

With specific reference to claim 3 and 4, Hill teaches the light signal being reflected at a beam splitter **40** prior to entering a polarizer **72** to create a reference frequency. (See at least **column 13, paragraph 4**)

With specific reference to claim 5, Paldus teaches that the two polarizations can be perpendicular to each other, i.e., p-polarization and s-polarization. (See at least **column 9, paragraph 5**)

With specific reference to claim 8, Paldus teaches a mirror **122/234** translated by a PZT **126/236**, which effectively changes the size of the cavity and the ultimate distance optical signals has to travel from the cavity to the detector.

With specific reference to claims 7 and 9, Paldus and Hill teach an optical phase detector having a light source, a target, a detector, and a processor except for the target comprising a SPR. Applicant has admitted in review of prior art that usage of SPR is known in the art (Yu et al.) Other prior art that made similar observations include: US PGPub 2005/0052655 to Jones et al., US PGPub 2005/0048599 to Goldberg et al., and US Patent 6,330,064 to Reider. It would have been obvious to one having ordinary skill in the art to use and SPR as part of optical phase detection. The motivation would be that in areas such as bio-sensing, SPR's non-involvement of any florescent tagging process significantly simplifies the preparation procedures of biomolecule species.

With specific reference to claims 12-15 and 18-20, although they disclose a detection method, all the limitations recited are also met by Paldus and Hill. Furthermore, these method claims simply present the most logical and obvious means the device claimed herein should be used. These claims are also considered unpatentable and rejected.

With specific reference to claim 17, Paldus and Hill teach the method of phase detecting as disclosed in claim 12 except for phase being recorded against wavelength. Plotting phase versus wavelength is known in the art (e.g. U.S. Patent 6,801,689 to Sweetser et al., column 4, paragraph 2) and it would have been obvious to one having ordinary skill in the art at the time the invention was made to do so in conjunction with

Paldus and Hill. The motivation would be that phase versus wavelength is one of the method used to determine the phase function.

Allowable Subject Matter

Claims 6 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Paldus and Hill teach the optical phase detector and a method of using the same except for the phase difference is the phase of the p-polarization component. It is the examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the base claim.

Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Paldus and Hill teach the optical phase detector but not the additional components including a polarization maintaining coupler, an optical relay element coupled to a first output of the polarization coupler, a polarizing beam combiner coupled between the optical delay element and a second output of the polarization maintaining coupler, and the polarization beam combiner coupled to a collimator. It is the examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the base claim.

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Paldus and Hill teach the optical phase detector except for a tuning rate of the tunable optical source. Although there are teachings of tuning rate of tunable optical source in the art, prior art does not teach or suggest the teaching of a relationship between the tuning rate and a frequency offset and a relative delay. It is the examiner's opinion that the prior art of record, taken alone or in combination, fails to disclose or render obvious in combination with the rest of the limitations of the base claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charlie Peng whose telephone number is (571) 272-2177. The examiner can normally be reached on 9 am - 6 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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